

SYNCHRO — SETTE

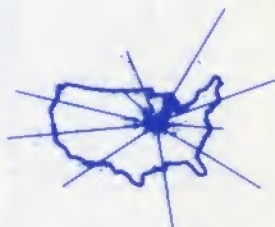
THE SUBSCRIPTION MAGAZINE FOR THE SINCLAIR ZX-81 / TS-1000
MICRO COMPUTERS

VOLUME 2..... NUMBER 5..... MAY 1983..... \$2.00



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FORTH FOR THE ZX/TS

I have heard much about the FORTH language but have never seen it. It is claimed to be easier to learn than BASIC and makes routines operate with the speed of the FAST mode without losing the screen display.

E.W. Rowley & Associates, of Bryan Ohio, intends to market soon, a solid state FORTH device. The computer would be taken apart, and the FORTH chip inserted between the circuit board and one of the ROM chips in piggy-back fashion. FORTH could then be used as soon as the computer is turned on.

Unlike many other FORTH programs, this version will allow full use of the printer. We are supposed to be receiving a sample of this device soon for testing and hope to have a monthly FORTH column in the magazine.

No price yet, but we should have more info available next month.

TELEPHONE MODEM IN THE WORKS

Why another telephone modem when others exist and Timex plans to have theirs out soon?

Consider the features:

- no RS-232 interface needed
- direct hook-up between wall socket and phone cord
- phone can be used normally, whether modem is used or not
- no power source needed

The user would disconnect the telephone cord from the wall and plug it into the modem. The telephone cord would then be connected to the modem along with connections for the computer and cassette recorder.

EDITOR RAMBLINGS



The user can then call another user with the same set-up and programs or data information can be sent back and forth while both users listen to the pulse transmissions through the handsets.

The device would have the capability to transmit and receive data from cassette recorder to recorder, computer to recorder or recorder to computer.

It has the ability to amplify both outputted and inputted data and will filter and clean the pulse signals, even under most long distance situations. It will work with any cassette data based computer that operates between 250 to 1500 Baud and zeroes in on that particular computer's Baud rate while virtually eliminating all other sounds from being transmitted or received.

However, the actual sound pulses being transmitted or received would be regenerated to where the pulse sine waves would be squared (as seen on an oscilloscope) to their original pattern.

The use of such a modem, for

those of us who are not acquainted, would enable individuals or groups to share data or bulletin board information for the price of a phone call.

The price of the modem from Eulyn Enterprises is projected to be under a hundred dollars. The bad news - it's not available yet. I am supposed to see and test a set around the beginning of June and will let you know about them as soon as I can. Eulyn, by the way, is the same outfit that markets the Digitalizer mentioned in last month's mag. It also isn't available yet to the public although we have tested that device.

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TS-1500/2000 NEWS

At the present time, please consider the following news as pure speculation.

Timex expects the TS-1500 to be available sometime in July and the TS-2000, sometime in August. A different but usually reliable source expects availability to be about a month later but

This same source says we can expect the 1500 to sell for around \$75 to \$80 when initially introduced. The 16K 2000 will sell for \$90 and the 48K version for \$140. Quite a difference from the prices we first heard.



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***** A GAME OF WITS *****

CONJECTURE

CONJECTURE, A GAME OF WITS

Do you enjoy word games? Here is a nifty little 32 line program that is a lot like HANGMAN:

```

10 PRINT AT 10,0 "INPUT YOUR M
20 MESSAGE?"
30 INPUT A$
40 LET B$=A$
50 FOR N=1 TO LEN A$
60 IF A$(N)="" THEN LET B$(N)
70 NEXT N
80 CLS
90 PRINT AT 10,(31-LEN B$)/2,B$
100 LET P$=""
110 INPUT T$
120 IF LEN T$=1 THEN GOTO 130
130 LET C$=T$
140 IF C$=B$(N) THEN GOTO 150
150 IF C$=B$(N) AND B$(N)="" THEN
160 GOTO 170
170 NEXT N
180 IF C$="" THEN LET P$=P$+1
190 IF P$=5 THEN LET B$=""
200 IF B$="" THEN LET P$=1
210 IF P$=1 THEN LET B$=""
220 GOTO 10
230 PRINT AT 10,(31-LEN B$)/2,B$
240 LET P$=""
250 PRINT AT 10,0 "ENTER NUMBER
260 PRINT AT 20,0 "PASSES NUMBER
270 RETURN
280 IF C$="" THEN PRINT AT 20,0
290 IF YOU GOT IT IN P$ PASSES
300 IF C$="" THEN PRINT AT 20,0
310 PRINT "*****
320 PRINT "*****
330 PAUSE 300
340 CLS
350 RUN

```

With this two player game, a person enters a group of words whose total amount of characters, including empty spaces, does not exceed 32 in number.

The computer will then replace the characters with graphic periods and display the result on the center of the screen. The other player is then challenged to guess the sentence in 5 passes by entering one

letter at a time. If the letter is in any word in the sentence, it will replace the graphic periods as many times as it occurs and the pass won't be counted.

If the letter does not appear in the sentence, a pass will be charged against the player. Five passes are allowed before the game is over and the message will appear.

If the player thinks (s)he knows what the message is, it can be typed in and the computer will tell whether it is right or not. If the inputted guess is wrong, the game will be over.

The limit of 5 passes can be changed to make the game harder (ha ha) or easier by editing the <6> in line 330.

This program can have a lot of features added to it, such as Player's names, score keeping, high score by name, timer with INKEY\$ input, etc.

Another much more elaborate two player word game is "SCRAMBLED WORDS" on BOSS package #101 where there are 200 common five letter words in a data base. The screen displays one word at a time with the letters mixed up and challenges the current player to input the correct spelling of the word as a 60 second clock counts down and is displayed on the screen. If the player spells the word correctly, whatever time is left on the clock is added to his or her score. If time runs out, the word is displayed. The game cycles between two players with 10 words each and then totals the scores.

These types of games are excellent for forcing the players to accomplish a mental task because of the time element involved. A clocking routine could be added to the "CONJECTURE" program where a character would have to be inputted in a certain amount of time or a pass would be lost.

the Computer Tutor

REVERSE SCROLL WITH MACHINE LANGUAGE SUBROUTINE



Good morning Class. Sorry I wasn't able to make it last session. We have had some people who notified us to tell me that the line-renumbering routines from last class didn't work properly. I have noticed that in large programs, only about the first 60 lines were renumbered. One person told me that the routine itself became renumbered and blew the program.

Whenever data is POKed into memory, a condition can exist that may create the desired effect with one machine such as the TS-1000 but will not work properly on another such as the ZX-81. Without intensive checking, I believe there is a subtle difference in ROMs between these two machines and even possibly between the earlier and later ROMs used in the ZX-81s.

To demonstrate this effect, the following is a program that creates a reverse scroll on the screen with a graphic flag:

```
10 GOSUB 9000
20 DIM A$(23,32)
30 LET C$="*****"
40 LET D$="*****"
50 LET E$="*****"
60 LET F$="*****"
```

```
70 FOR N=1 TO 5 STEP 2
80 LET A$(N,8 TO 26)=C$
90 LET A$(N+1,8 TO 26)=D$
100 NEXT N
110 FOR N=7 TO 11 STEP 2
120 LET A$(N,8 TO 26)=E$
130 LET A$(N+1,8 TO 26)=F$
140 NEXT N
150 LET A$(13,8 TO 26)=E$
160 FOR N=1 TO 22
170 PRINT A$(N)
180 NEXT N
190 LET A=1
200 LET B=A+1
210 IF B=23 THEN LET B=1
220 LET C=A-1
230 IF C=0 THEN LET C=22
240 PRINT AT USR X,0,A$(C)
250 LET A=C
260 GOTO 200
2999 STOP
9000 REM REVERSE SCROLL ROUTINE
9010 FAST
9020 LET X=30000
9030 LET Z$="0106022A0C400954500
165022A0C4009E0B8C9"
9040 FOR N=1 TO LEN Z$-1 STEP 2
9050 POKE X,16+CODE Z$(N)+CODE Z$
(N+1)-476
9060 LET X=X+1
9070 NEXT N
9080 LET X=30000
9090 SLOW
9100 RETURN
```

Instead of the flag scrolling from the bottom of the screen up, the reverse occurs. The speed of the scroll is much faster, too.

The problem is that although this program works fine on a TS-1000, the scroll won't work on any of the ZX-81s we have around here.

Unlike other machine language routines that depend on a REM statement in the first line of the program, this routine is

held in a sub-routine starting with line 9000 and is initialized before it is needed by the GOSUB instruction in the first line.

The two methods of machine language entry that most text material proposes are:

1. creating a loop to input each hex code into memory separately.
2. putting the routine after a REM statement in the first line of the program.

The first method may involve saving the routine separate on tape, typing in NEW, POKEing in numbers to change RAMTOP, etc.

The possibilities of making mistakes can cause some time-consuming efforts where programs crash or just won't work. If the routine follows a REM statement in the first line, it is accessed by calling a user routine (USR) from memory location 16514 which is the beginning memory location of the first character following the REM statement.

I personally don't like either method although sometimes there is no choice. But once in a while, a different, easier method can be used. The one I propose can be put just about anywhere in the program.

The routine is POKed into the memory locations of a 16K TS-1000, starting with decimal 30000 in RAM, although any available RAM memory location can be used as long as the main program isn't residing in it.

From that point on, whenever it is needed, it is called upon with the PRINT AT USR call in line 240.

The string variables in lines 30 to 60 contain the various graphic components of the flag

(consult the GRAPHICS entry methods in the owner's manual if you're not certain).

These strings are then entered into a 23 line matrix by the routines from line 70 to 150 and also line 20. The flag is first displayed with lines 160 to 180. This is as far as the ZX-81 will perform.

The lines 190 to 260 perform the loop to scroll the flag with line 240 doing the actual scrolling.

You can experiment with this program by eliminating the lines from 30 to 150 and creating your own string variables from A\$(1) to A\$(23). You can use the LET command to accomplish this or set up a FOR/NEXT loop such as the following:

```
30 FOR N=1 TO 22
40 INPUT A$(N)
50 SCROLL
60 PRINT A$(N)
70 NEXT N
80 CLS
```

The routine in assembly language that creates the scroll is as follows:

01D602	LD BC, 726
2A0C40	LD HL, (16396)
09	ADD HL, BC
54	LD D, H
5D	LD E, L
01B502	LD BC, 693
2A0C40	LD HL, BC
09	ADD HL, BC
EDB8	LDDR
C9	RET

The characters in the left column represent hexadecimal codes. You will notice that they are in multiples of 2. They are used by the computer in pairs. The characters in the right column represent what these pairs of characters do. Numbers are loaded into memory locations, added or subtracted from numbers in other memory locations, etc. The final

(consult the GRAPHICS entry

instruction, <C> is for the routine to RETURN to BASIC. Assembly language is a method of entering machine code that has similarities to the BASIC language. The USR in line 240 acts like a GOSUB command, but it jumps out of the BASIC program. The RET in the machine language routine acts like the RETURN in the BASIC language but returns the routine from machine language back to BASIC. If C9 does not end the routine, the program usually will not allow the user to perform such actions as BREAKing it.

Most people who attempt to understand machine or assembly code (myself included) become easily confused and frustrated when their time-consuming efforts are rewarded with some minor effect or a program crash.

Does anyone see a similarity between the assembly listing and the FLAG program listing? Yes, the gentleman in the rear has his hand up?

He says that line 240 in the FLAG program has the same code as the left column of the assembly code listing. Wow, right the first time!

That is correct! The characters in the left column are the only thing that the routine is concerned with. The right column is only an explanation of what they do. The gentleman in the rear has his hand up again but I know what his question is. He wants me to explain what they do.

No!

At this point, all I want to bring out is how to take these routines and utilize them in a BASIC program and the 9000 routine does just that. You will notice that line 9030 has the characters in the same order as they appear in the left column

instruction, <C> is for the

of the assembly listing. The routine from lines 9040 to 9070 takes these characters, two at a time, and POKE their decimal equivalents into adjacent memory locations starting with 30000. Line 9020 sets the variable <X> to the first memory location, 30000 for the routine, and then line 9060 increments <X> by one until the routine is totally inserted. Line 9080 resets <X> back to 30000 so that it can be called with <USR X> in line 240. <USR 30000> would work just as well.

Other USR commands that work for various routines are <PRINT USR X> and <RAND USR X>. Change line 240 in the FLAG program to:

```
240 RAND USR X or 240 GOTO
USR X
```

I see by the old clock that our session is coming to a close. For your homework, I want you to scour your TS or ZX textbooks for assembly or machine language programs whose listings end with C9 and enter the code into the string variable <Z\$> in the 9000 routine and then build a program around that routine to create some desired effect.

Send me in the mail any unusual or interesting effects with either a listing or on tape and I will share them with the rest of you.

CLASS DISMISSED!

PS - our thanks to those of you who responded to our request for machine language input - we should have something for our readers in the upcoming issues on a regular basis. We intend to keep it in a format that is easy for beginners to understand. We would appreciate letters regarding this month's tutorial, whether it was easy to understand or not and especially any unique methods using this technique or any others - Ed.

REVIEW OF BOSS PACKAGE #118
2 DATA PROGRAMS

"MAIL LIST" and
"INVENTORY CONTROL"

"MAIL LIST"

```
MAILING LIST PROGRAM

TO ENTER OR ADD DATA - 1
TO SEE OR CHANGE DATA - 2
TO CLEAR FILE - 3
TO SAVE DATA ON TAPE - 4
TO PRINT LABELS - 5
TO PRINT ALL DATA - 6

ENTER ONE OF ABOVE
```

If you have a printer, this program allows the user to create a list of up to 100 mailing entries. There are portions of the program that have pauses where the screen goes blank. The amount of time of the pause is determined by the fact that the program is dimensionalized to allow the 100 entries. Directions, however, are given in the documentation on how to redimensionalize if less entries will suffice so that the time pause can be kept to a minimum. The one area affected is after the last data entry is made and a return to the menu is in order. This condition is common to just about every data-entry BASIC program for the ZX/TS computers.

Other than this, the only other drawback is the lack of a sort routine which is many times useful.

The program MENU allows the user 6 options:

TO ENTER OR ADD DATA	- 1
TO SEE OR CHANGE DATA	- 2
TO CLEAR FILE	- 3
TO SAVE DATA ON TAPE	- 4
TO PRINT LABELS	- 5
TO PRINT ALL DATA	- 6

When using prompt #1 or #3, the following parameters must be observed:

The maximum characters that can be inputted for any field are:

LAST NAME	- 12
FIRST NAME	- 16
ADDRESS	- 16
CITY OR TOWN	- 16
STATE	- 2
ZIP CODE	- 5
PHONE NUMBER	- 12
REMARKS	- 12

Other than the normal items entered into this type of program, you will notice that two more fields have been allowed to make it more versatile, that is the entries for the PHONE NUMBER and REMARKS. All the data can be printed with option #6 to either the screen or printer.

With option #2, a new menu appears on the screen and allows the user three options:

1. The whole file can be displayed, one at a time with all the entered information for each file item.
2. Individual file items can be displayed on the screen.
3. The user has the option to edit any of the displayed file items on the screen.

With option #3, all data is removed so that a new file can be created.

With option #4, the entered

(cont. on page 13)

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data can be stored on tape.

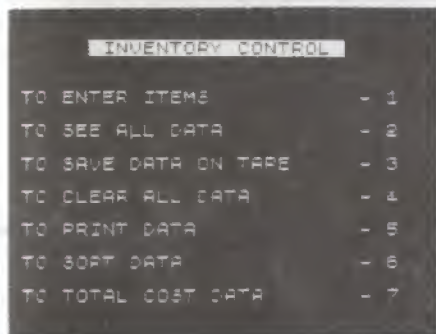
PRINTING LABELS

With option #5, the user is asked to press ENTER for a sample label so that the labels can be properly aligned. Most tractor-feed printers allow 8 lines from center of one label to the center of the next label. If you need more or less, instructions are given to edit the program.

PRINTING ALL THE DATA

Option #6 is similar in use to option #5 but with all the data being printed out.

"INVENTORY CONTROL"



This program is based on our December/82 Inventory program. This version, however, has three additional MENU prompts for more versatility. Again, the pause problem crops up again but not as drastic as in the first program. Instructions are given again to increase or decrease dimensionalization.

The program starts with the main menu:

```
TO ENTER ITEMS      - 1
TO SEE ALL DATA    - 2
TO SAVE DATA ON TAPE - 3
TO CLEAR ALL DATA  - 4
TO PRINT DATA      - 5
TO SORT DATA       - 6
TO TOTAL COST DATA - 7
```

OPTION #1: To enter items

The user is cautioned to not input numbers that exceed the limits of the program's design:

```
ITEM - 8 Character
max.
PART # - 6 Character
max.
UNIT COST 999.99 max.
ITEMS/UNIT 9999 max.
UNITS IN STK 9999 max.
```

To start the program, go to prompt <1>. The program will cycle, asking information about each inventory item. The first item is asked to be described by either name or description. Up to 100 inventory items can be entered.

Then the part number can be inputted, followed by the unit cost. If the unit is a package that includes more than one component, enter the cost for the whole package.

Prompt #2 from the main MENU will be the one used the most. A SECONDARY MENU is displayed where the user is given the choice of 4 prompts:

```
1 - SEE TOTAL INVENTORY
2 - CHANGE INVENTORY
3 - SEE ITEM DATA
4 - EDIT DATA
```

#1 displays all the inventory items by scrolling the data an item at a time.

#2 allows the user to add or subtract to any inventory item.

#3 displays the pertinent information of any item/unit.

#4 allows the user to edit any of the information of a stock unit except the inventory amount, such as the name, stock #, cost or items/unit.

Prompt #3 allows the user to

(cont. on page 19)

THE SPLIT MOVING MARQUEE



SPLIT MARQUEE

Bet you think you've seen
 just about every type of
 scrolling program imaginable!
 Here are two more that operate a
 little differently. I won't tell
 you what they do but I think
 you'll be glad you typed them
 in.

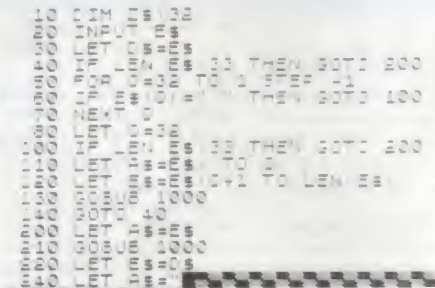
"SPLIT MARQUEE" version #1

```

10 DIM Z$(32)
20 LET A$= "SYNCHRO-SETTE PRES
EN'S
30 GOSUB 1000
40 LET A$= "THE SPLIT MOVING MA
RQUEE"
50 GOSUB 1000
60 LET A$= "ENTER AS MANY LINES
AS YOU WANT"
70 GOSUB 1000
80 LET A$= "BUT DON'T EXCEED 32
CHARACTERS"
90 GOSUB 1000
100 LET A$= "IN ANY LINE."
110 GOSUB 1000
120 GOTO 20
1000 IF LEN A$ > 2*(INT (LEN A$/2)
THEN LET A$=A$+" "
1010 LET B$=A$ ( TO LEN A$/2)
1020 LET C$=A$ ( LEN A$/2)+1 TO
1030 FOR N=1 TO LEN A$/2
1040 PRINT AT 10,16,C$(LEN C$-N+
1 TO LEN C$);AT 10,16-N,B$ ( TO N
)
1050 NEXT N
1060 FOR N=1 TO 100
1070 NEXT N
1075 COPY
1080 PRINT AT 10,0;Z$
1090 RETURN

```

"SPLIT MARQUEE" version #2

[illegible]

W.D.Y. SUKED.W?

The English language contains about 490,000 words, plus another 300,000 technical terms, the most in any language. Experts report that the average individual does not use more than 60,000 of those words.



An important list of words has recently been published. It's a new dictionary to improve busi-

ness communications skills. Called *The Dictionary of Business and Credit Terms*, it's used mainly by people in sales, retailing and marketing. It includes terms in a variety of fields including accounting, banking, credit, management, retailing and sales. For further information, contact the publisher: National Association of Credit Management, 475 Park Avenue South, New York, N.Y. 10016.

In written English, the most frequently used words are, in order: the, of, and, to, a, in, that, is, I, it, for and as. The most used in conversation is I. The commonest letter is "e" and the commonest initial letter is "T"



The diameter of our galaxy, the Milky Way, is about 100,000 light years.

LETTERS TO
THE EDITOR



Dear Ed,

The RAMPac connector on my computer was very intermittent and would crash the programs with any slight movement. Now I have the new Timex 2040 printer, which I love, installed between the computer and RAMPac. Now I can even pick the computer up and shake it - nothing happens.

This letter (re-typed by us - Ed.) was printed with your BABY SYNTAX program (by the following)

```
BREAK and enter - LPRINT A$ (1
TO B)
```

Thanks

R. Barrhart - Phoenix AZ

Dear Ron,

I tried the shake test you suggested with the same results. Although there seems to be some teeter-tottering, the connection does seem better.

Your printing hint with BABY SYNTAX works just fine and will print the entire text as it appears on the screen from beginning to end, including what's not on the screen.

One important note, however, is to make sure the cursor is at the end of the text you want to print before you hit the BREAK key - otherwise the text will only be printed up to the cursor. If the cursor is at the beginning of the text, nothing will be printed.

Format the text on the screen

as it is entered and it will be printed the same way - Ed.

Dear Ed,

Very much agree with your assessment of the new TS-2040 printer - - - except for one thing. This "thing" is really bugging me!

I've routinely used something like "PRINT TAB 30 - LEN STR\$ A; A" to neatly format columns of whole numbers. Doesn't work with LPRINT and the printer. Neither does "LLPRINT AT 0, 30" etc.

How come and how do I solve it?

Thanks - J. Banks Jr.,
Ridgefield CT

Dear Joe,

I don't know why - but I can tell you how to solve it. The secret lies in converting the number into a string variable, like you have already done, but also attaching enough blank spaces before the number. This sample routine will do it:

```
10 DIM B$(30)
20 INPUT A
30 PRINT TAB 30-LEN STR$ A;A
40 LET A$=B$( TO 30-LEN (STR$
A))+STR$ A
50 LPRINT A$
60 GOTO 20
```

A\$ becomes the string variable with the number occupying the last characters of the string. I'm sure there are other ways of doing it, too - Ed.

Dear Ed,

This month's (April/83) article on RENUMBER is one I received with open arms. I've used it with limited success. Most of the time, the screen goes blank and it will not BREAK. There's nothing left to do but "pull the plug" and start over. Twice program lines renumbered themselves but I had no EDIT capabilities afterwards. All the program would do is LIST but it wouldn't RUN. Once again I had to pull the plug.

I tried all four routines with the same or similar results. Versions B & C are identical, aren't they? Perhaps you will have more on this in your next issue.

In respect to "The People's Computer", in my unsolicited opinion, IT IS the TS-1000.

Keep up the good work,
Willy Manuel - Las Vegas, NV

Dear Willy,

Actually, all four versions use the same PEEK & POKE methods - and you are right about the renumbering problems. The Old Professor relates to this in this month's tutorial.

Whenever POKES are performed within existing program area, strange things can happen - the disabling of the LIST, RUN and EDIT can be a few.

I have noticed that if the line-renumbering routine is RUN without any additional program lines, the routine will renumber part of itself and then bomb. Yet if the program to be renumbered is too long, the first un-renumbered line can't be edited. Also, the maladies are not consistent between the ZX-81 and the TS-1000.

Regarding the TS-1000 as the "People's Computer", too many complaints abound regarding the dislike for the membrane keyboard and the RAMPack causing program crashes.

My own dislike is its inability to store data on tape, separate from the program.

The TS-1500, on the other hand, will overcome these first two problems and the TS-2000 will overcome them all and have color to boot. It is not imperceivable to envision a 48K version of the TS-2000 to be selling for less than \$100 about a year from now. I predict everybody and his (her) mother will own one.

But who am I to make such prophecies. The ZX/TS machines have sold well over a million so far in just the U.S., which makes the ZX/TSs the largest selling computer in the time span they have been available.

Besides, every year I pick the Bears to go to the Super Bowl

Ed.

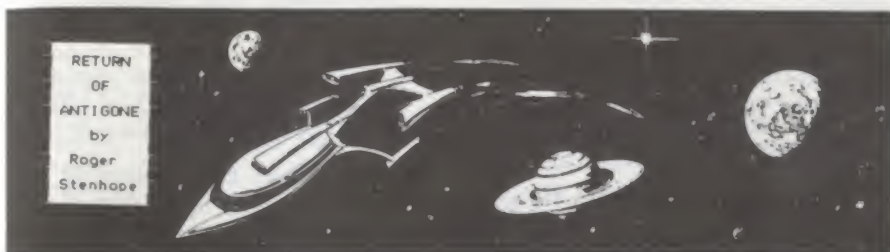
IT'S A RECORD!



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These facts are provided by the Chamber of Mines of South Africa, the trade association of the South African Mining Industry.



The police van pulled smoothly out of the driveway of the Taylor residence. Marcus and Edith sat in the locked interior. The arresting officer read Marcus his rights.

"You have been charged with a violation of section 3552 of the State of Vermont Penal Code - Failure to respond to rehabilitation procedures. Your case has been processed and trial is awaiting at County."

"I wasn't feeling well. I meant to call!"

The officer shut the little connecting window.

The automatic extinguishing equipment put out the fire, but not before the synthesiser was damaged extensively. EB7 was asphyxiated. Patrian knelt over him and scanned for life forces but found none. Preliminary indications were death by embolism.

Patrian couldn't help but notice the similarity between himself and the lifeless form laying before him. There was nothing he could do. He felt a great sadness. This was the first humanoid he had encountered in many years.

His attention was diverted to the synthesiser. Perhaps some answers to the many questions could be found here. He started to analyze-scan the wreckage.

"The fleet should be arriving in the E quadrant in a few minutes. No, all contact was lost. Long range scanners detect a small explosion with gaseous discharge. We should know what happened soon."

Swanson removed the headset. He was one of the few that would not allow the transceiver biochip implant. When he was a young cadet with the Time-Force, the laws were different but that was many years ago. Now, all cadets had to have the implant. A State religious governing body tried to pass a law that would mandate the old-timers with the chips but apparently enough of the old-timers had enough clout left where, as a group, they were left alone.

The first reports started coming in.

"EB7's dead! The room is damaged and almost empty and the synthesiser module is missing. The atmosphere is gone and that's probably what killed EB7."

"Anybody circle the asteroid to look for the synthesiser or what caused the explosion?"

"Charlie's five units report negative. There's nothing within a million miles in any direction."

Swanson willed the sign-off. He couldn't make heads or tails of what was happening. Charlie's

squadron got there within a half-hour after the explosion. Something should have been found. The synthesiser had the capability to time-transport or receive up to ten cubic meters through its attached booth. It itself, however, was dormant.

Perhaps whoever or whatever entered the booth came from the future and was able to transport a mass as large as the synthesiser through time. But why was EB7 killed? Why couldn't the synthesiser contain the force?

They made Edith wait in an outer room. Marcus entered the courtroom alone. No one was there and only one chair occupied the center of the floor.

Marcus sat down and waited. A voice boomed from nowhere.

"You are charged with violating section 3552 of the State of Vermont Penal Code. How do you plead?"

Marcus looked in all directions for someone speaking. It sounded like the voice was coming from about five feet in front of him.

"Who are you? Where are you?"

"I am the Cyber-Judicial Quorum. I was installed in April of 1997 to replace the CAJS or Computer Assisted Jurist System. I am completely without human assistance and act as both judge and jury as was the system popular up to two years ago.

Do you understand the charges against you?"

Marcus stared with empty eyes. He didn't understand much of the new technology. Like most of the elderly, he just accepted progress. If you asked

questions, you appeared stupid. Marcus feared the wrath of the young.

"I did nothing wrong! I wasn't feeling well! Is this about missing the meeting?"

"To put it in simpler terms, you were told that when you were rehabilitated, the follow-up meetings were mandatory. You agreed that you understood to miss any of these meetings was in violation of law."

Marcus's thoughts drifted back to the first meetings.

"I don't really recall. I suppose I remember something about not missing the meetings. My memory isn't what it used to be."

Life was much easier to understand before the power was given to the computers. Marcus remembered the days when a case sometimes took years to reach the courtroom.

"In light of the facts that this is your first offense and your advanced age and previous medical history, there will be no sentence. Future reoccurrences could result in your assignment to a work program.

You are free to go, Mr. Taylor, but in the future, remember your obligations. They're for your own good, you know. We wouldn't want you to have any problems, now would we? If you have a problem where you can't make it, contact the Rehab Center at least 30 minutes before your scheduled meeting. I hope I don't see you here again. Goodbye, Mr. Taylor."

Marcus left the same way he came in. Damned computer showed more compassion than the two police officers. How about that?

The synthesiser didn't even look the same when Patrian was finished. Burned out circuits repaired and re-designed. The temporal field was no longer internal. The synthesiser generated one large enough to encompass itself and the humanoid.

Patrian thought at first that he was in a different star system because the red giant was replaced by a stable yellow star. He eased the synthesiser forward in time and observed the sun. Millenium passed in an instant. He watched the sun expand until it engulfed the inner planets. He stopped the flow.

Patrian eased backward in time and space. He again watched as the image of the red sun shrunk until it was bright yellow and smaller once more. He retroquated farther to a time millions of years before initial departure.

The humanoid noticed a small blue-green planet. Within minutes he landed the craft in an area lush with vegetation.

He knew what he had to do.

Data programs continued

save the file on cassette. The FILE NAME: that is asked for will be the name used when you want to retrieve the file at a later time.

Prompt #4 allows the user to clear all the data from the program and start from scratch. A good time to do this would be if one file is complete and saved and another is to be created.

Prompt #5 allows all the data to be printed.

Prompt #6 has a unique feature in that it allows all of the data to be sorted by one of the fields specified by the user. This means that a sort can be performed where the items are listed by name alphabetically with the associated field data or by stock # in numerical order, etc.

Prompt #7 totals each of the item's costs and also gives a grand total at the end of the list with optional print-out.

This last feature gives this program the flexibility to be used as a purchase order or invoicing program that packs quite a bit of power.

=====



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2. CYPHER - if you are interested in the world of cryptology, this is the program for you. We have showed this program to cryptology buffs and have yet to have anyone be able to decipher even the simplest messages - yet you can easily code and decode any message yourself - as long as you know THE KEYWORD which you designate and can change to create an entirely new coded message. Do you have any text that falls under the category "FOR YOUR EYES ONLY". This program will allow you to save it on tape or print it out either coded or decoded.

**BOTH FOR
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